Scientific American.

THE ADVOCATE OF INDUSTRY AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. 2. NEW YORK, NOVEMBER 6, 1846. NO. 7.

THE NEW YORK
SCIENTIFIC AMERICAN:
Published Weekly at 128 *Fulton Street,*
(Sun Building,) New York.
BY MUNN & COMPANY.

RUFUS PORTER, EDITOR.

TERMS.—$2 a year—$1 in advance, and the remainder in 6 months.

☞ *See Advertisement on last page.*

Home.

Where burns the fireside brightest,
Cheering the social breast.
Where beats the fond heart lightest,
Its humble hopes possessed?
Where in the hour of sadness
With meek-eyed patience borne—
Worth more than that of gladness,
Which mirth's gay cheeks adorn?
Pleasure is marked by fleetness,
To those who ever roam:
While grief itself has sweetness,
At home—sweet home!

There blend the ties that strengthen
Our hearts in hours of grief—
The silver links that lengthen
Joy's visits, when most brief;
There eyes in all their splendor,
Are vocal to the heart;
And glances bright and tender,
Fresh eloquence impart;
Then, dost thou sigh for pleasure?
O! do not wildly roam;
But seek that hidden treasure
At home—sweet home!

Does pure religion charm thee,
Far more than aught below?
Would'st thou that she should arm thee
Against the hour of wo?
Her dwelling is not only
In temples built for prayer;
For home itself is lonely,
Unless her smiles be there;
Wherever we may wander,
'Tis all in vain we roam,
If worshipless her altar,
At home—sweet home?

Metrical Grammar.

An exchange gives the following for the benefit of juvenile readers:

1. Three little words we often see
Are Articles, a, an, and the.
2. A Noun's the name of any thing,
As school, garden, hoop, or swing.
3. Adjectives tell the kind of noun,
As great, small, pretty, white or brown.
4. Instead of nouns the Pronouns stand;
Her head, his face, my arm, your hand.
5. Verbs tell of something being done;
To read, write, count, sing, jump or run.
6. How things are done the Adverbs tell,
As slowly, quickly, ill or well.
7. Conjunctions join the words together,
As men and women, wind and weather.
8. The Preposition stands before
A noun, as in or through a door.
9. The Interjection shows surprise,
Oh! how pretty! ah! how wise!

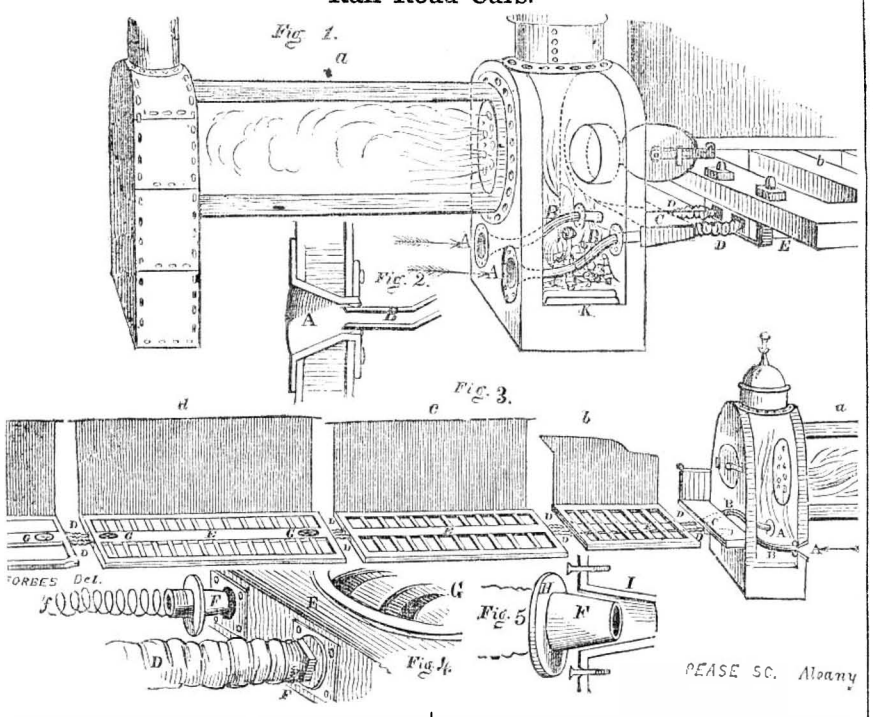
The whole are called Nine Parts of Speech,
Which Reading, Writing, Speaking teach.

The Great Copper.

A contract has been taken by Mr. Scovil, the proprietor of the patent drilling machine, to break and raise, in pieces not exceeding one ton each, the celebrated mass of copper, found near Lake Superior, estimated to weigh 20 tons. The work is to be accomplished within the present month.

The Connecticut River Railroad has been put in operation as far as Deerfield, and within two miles of Greenfield, Mass.

Townsend's Patent Apparatus For Warming and Ventillating Rail Road Cars.



INTRODUCTION.—Every person who has been accustomed to travel by railroad in cold weather, has experienced inconvenience in being seated so far from the stove as to be chilly and cold, and so near the stove as to be uncomfortably warm, and perhaps compelled to leave the seat. To remedy such disagreeables is the object of Mr. Townsend's invention. It is intended to furnish each and every car with a constant current of *fresh* heated air sufficient to keep the temperature uniformly 'about right.'

EXPLANATION.—Through the furnace of the locomotive are passed two cast-iron pipes, which presenting enlarged orifices in front as seen at A, pass, and if necessary, repass, and pass through the furnace in the midst of the fuel, as seen at B, and these communicate backwards with the reservoir, situated in the platform C, upon which the fireman stands.—From thence the heated air is conducted by means of *elastic flexible* hose D, into continuous air chambers E, which are let into the sleepers of each car, and from these the warm air is received, into the cars by registers G, in such quantity as is required to render the atmosphere comfortable and pleasant. The elastic and flexible hose are constructed from such materials as to render them durable.—These are connected to the cars by beveled metallic pipes F with flanges, and are attached to both ends of the hose which are kept in place by the strength of the spiral spring, *f*. Fig. 4. represents an enlarged view of the hose, and end of the air chamber E, with a portion of the register G with a part of a complete hose D, fully connected to the air chamber at F, and, *f* respresents the spiral coil of wire within. Each car is furnished with two registers to accommodate the running of the cars either backward or forward. Cap screws H are screwed on to the orifices in the end of the chambers in summer, and also on to the two orifices in the end of the chamber in the last car of a train in winter, to prevent the escape of the warm air; *a* in the above cut represents the furnace and pipes in the locomotive, the *b* tender—*c* a baggage car, and *d* a passenger car.

A happy comparison.

A distinguished divine of this city, in alluding to the magnetic telegraph, spoke of it as the "*highway* of *thought*."—*Albany Citizen.*

And what is there in that expression, to constitute a 'happy comparison,' Mr. Citizen? We see nothing therein but what might have been said by forty common laborers at different times, without exciting any attention. The only circumstance, then, which renders the appellation a 'happy comparison,' is that it was spoken by a "distinguished divine." That's it.

Singular Accident.

Dr. Wm. C. Warner, of Bristol, Vt. being at Montpelier last week, took a dose, which he probably supposed to be morphine, but which proved to be strychnine, and which notwithstanding the immediate attention of another physician, caused his death in ten minutes.—If those disposed to suicide were acquainted with this strychnine, they would probably prefer it to arsenic or opium. Such a poison should be prohibited.

The Beauty of the Fighting System.

It is stated that one half of the whole revenue of Great Britain, is devoted to paying the interest of the cost of former wars, and nearly one half of the remainder is spent in preparing for future wars, viz: in maintaining the army and navy.

Lake Erie Telegraph Company.

We learn from the Cleveland Herald, that a company has been formed to extend the magnetic telegraph, from Buffalo to Detroit, around the southern shore of Lake Erie. Capital stock $170,000.

Domestic Industry.

A New Hampshire man came to Boston with 500 dozen pair of knit stockings, being half his fall supply. He has a yarn factory, and he sends the material into all the farmers families, far and near, and it is made into stockings, and then farmer's wives, daughters and children, are paid for their labor in money or goods from the store.

Plocondragobbleiferous.

In a descriptive article, now going the rounds, the following high flown sentence occurs: "Through the mountain gorges stray the sullen bear and tawny moose, while the beautiful deer feeds along the solitary waters, and the treacherous panther screams in the tangled thicket."

Curious.

Gull Island, on Lake Ontario, which has been for seven years submerged, has again made its appearance above the surface of the water, and the lake is lower now than it has ever been known to be.

A LIST OF PAT NTS

Issued from the 22d of August to the 20th of September, 1846, inclusive.

DESIGNS.

To George W. Fulton, of Brazoria, Texas, for improvemevt in Propelling vessels. Patented the 26th Aug., 1846.

To Adolphus F. Ahrens, of Philadelphia, Pa., for improvement in the Horse Power.—Patented 26th August, 1846.

To Loftis Wood, of New York city, for an improvement in Cooking Stoves. Patented 26th August, 1846.

To John P. Hayes, of Boston, Mass., for improvement in Cooking Ranges. Patented 26th August, 1846.

To Arad Woodworth, 3d, of Worcester, Mass., for improvement in machinery for plaining Blind Slats. Patented 26th August, 1846.

To Loftis Wood, of New-York city, for improvement in Stoves Patented 28th August, 1846.

To Isaac Jaques, of Elizabethtown, N. J., for improvement in Tailors' Shears. Patented 28th August, 1846.

To Charles Carlisle and Edwin Estabrook, of Norwich, Vt., for improvement in dressing Mill Stones. Patented 28th August, 1846.

To Wm. Dysert, of Gettyburgh, Pa., for improvement in Cultivators. Patented 28th Aug., 1846.

To Wm. Howe, of Springfield, Mass., for improvement in Truss Bridges. Patented 28th August, 1846.

To Andrew H. Teeple, of New York city, for improvement in Machinery for punching Metallic Sheathing. Patented 28th August, 1846.

To Major H. Fisher, of Bridgewater, Mass., for improvement in File cutting Machinery. (Assigned to Joseph A. Hyde.) Patented 28th August, 1846.

To Samuel Wilt, of Hagerstown, Md., for improvement in the Plough Clevis. Patented 3rd September, 1846.

To John R. Remington, of Lowndes county, Alabama, for improvement in Stump Extractors. Patented 3d Sept., 1846.

To Oliver S. Hartshorn, Henry M. Payson, and Aaron Ring, of Portland, Me., for improvement in Combined Stoves. (Assigned by A. Ring to Hartshorn & Payson.) Patented 3d Sept., 1846.

To David Chappel, of Sheldon, Vt., for improvement in Ox Yokes. Patented 3d Sept., 1846.

To Alexander M. Wilson, of New York city, for improvement in Mowing Machines. Patented 3d Sept., 1846.

To James S. Gwynne, of Pittsburgh, Pa., for improvement in separating Oleic and Stearic acids. Patented 3d Sept., 1846.

To Clark Jacobs, of Brooklyn, N. Y., for improvement in Machines for hulling and pearling Rice. Patented 3d Sept., 1846.

To James Jones, of Rochester, N. York, for improvement in Window Sash fasteners. Patented 3d Sept., 1846.

To Thomas W. Harvey, of N. York city, for improvement in Machinery for heading Screw Blanks. Patented 3d Sept., 1846.

To Horace Merrell, of Wheatland, N. York, for improvement in setting Saw Logs. Patented 3d Sept., 1846.

To Wm. C. Bussey, of Rockgrove, Ill., for improvement in Machines for Ditching and Embanking. Patented 3d Sept., 1846.

To Thomas L. Fortune, of Liberty, Mo., for improvement in Hemp Brakes. Patented 3d Sept., 1846.

To Wm. R. Acton, of Richmond, Va., for improvement in Tailors' measures. Patented 5th Sept., 1846.

To Mylo Knapp, of Springwater, N. York, for improvement in the mode of attaching horses to wagons. Patented 5th Sept., 1846.

To John H. B. Latrobe, of Baltimore, for improvement in Stoves. Patented 5th Sept. 1846.

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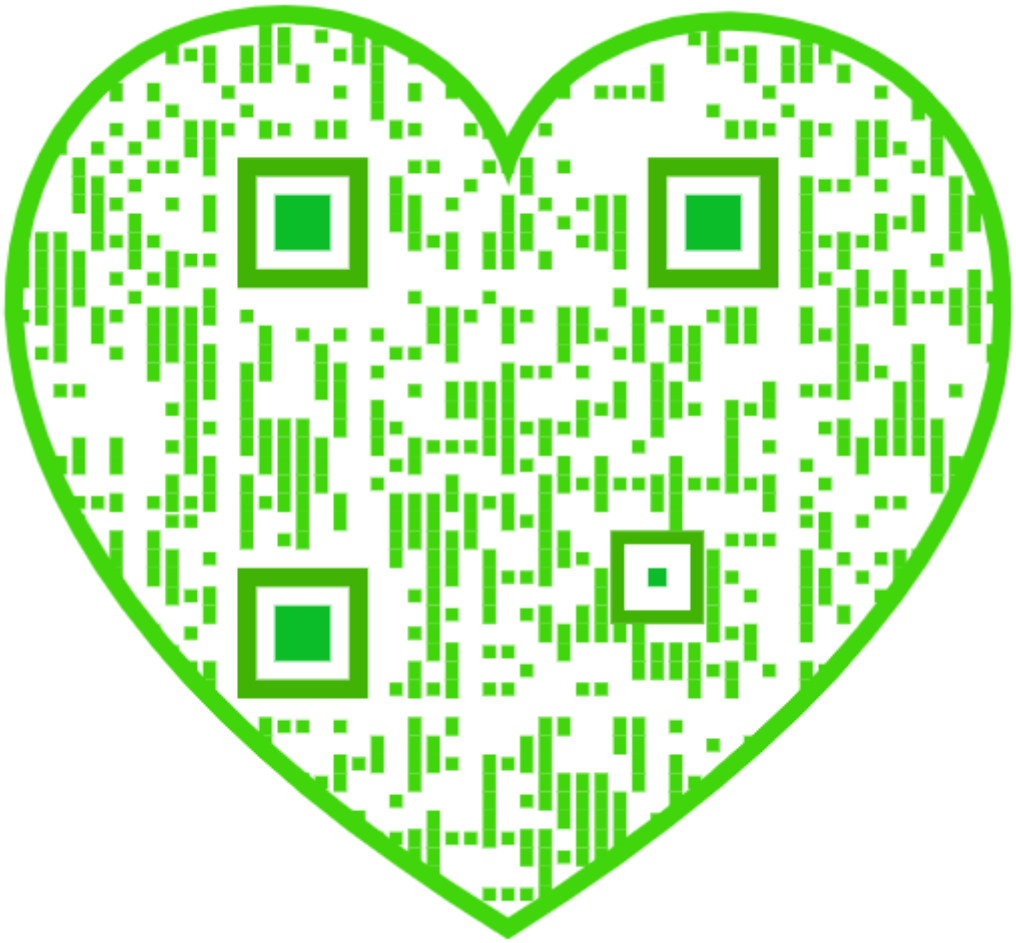

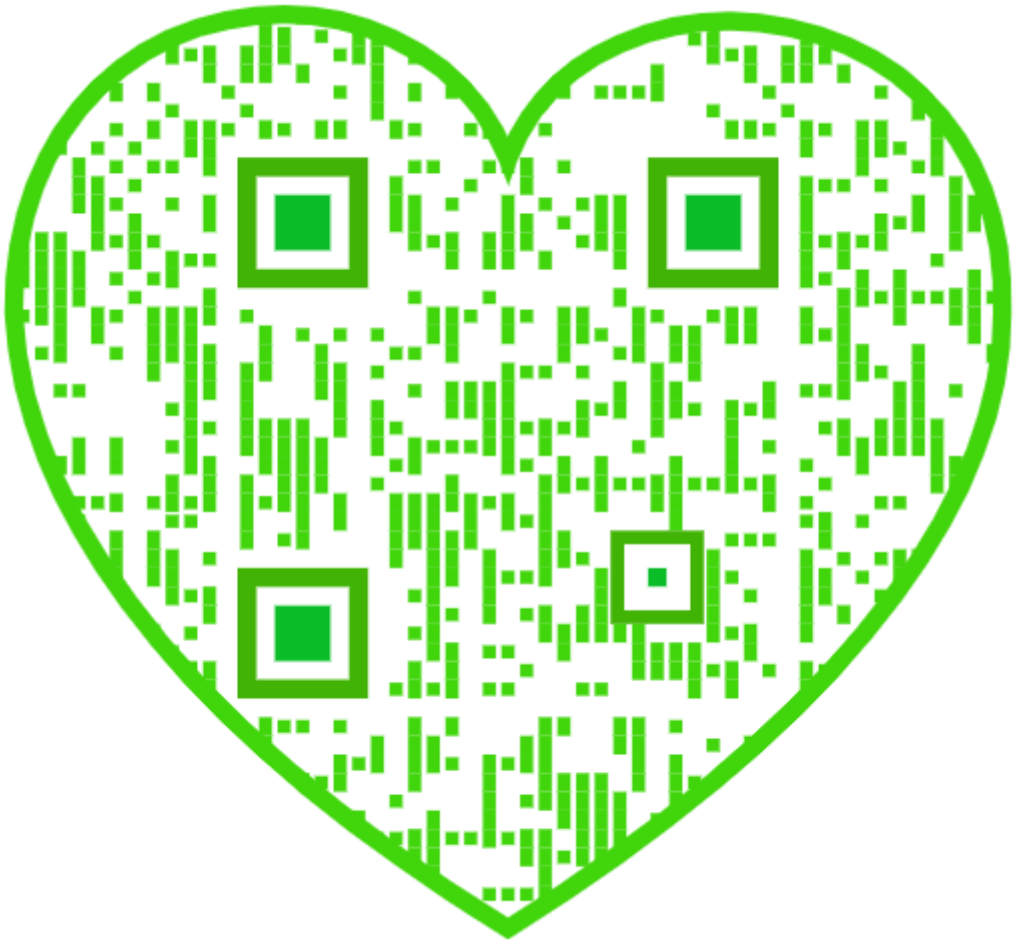

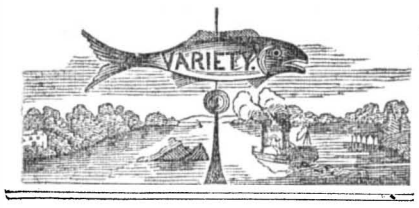

Rat-a-tat-tat!

OR, THE COSTUMER AND THE CORDWAINER.

A man went hastening down the street,
And his hat was over his eye,
And he took his strides so long and fleet,
That every body he chanced to meet
Stopped and stared,
And then declared,
He must be some great government cheat,
Scudding away to his country seat:
For he shook his head, and then his fist,
And then he struck at the wind and miss'd,
And slapp'd his thighs,
And d—d his eyes,
As he was hastening down the street,
And the way he was going was hard to beat,
By any man of his size!

A man was hard at work in a shop,
Thumping away on a boot,
A stone on his lap, the boot a-top,
And a strap went under his foot,
Which served to keep the stone from jumping,
While the man the boot was thumping,
And he hammered as he sang,
While the merry lap-stone rang,
Echoing the *aggravations*,
With marmorean vibrations.
Rat-a-tat-tat,
'The fiddle and cat!'
There the man hammer'd and sang as he sat!

When he who was hastening down the street,
Appear'd at the door, in a deuce of a heat,
And into the shop
He came with a pop,
And says he,
'Grah-ma-chree,
Is it that
You are at?'
Said the man with the boot, 'Troth it is, and that's flat,'
Rat-a-tat-tat, rat-a-tat-tat!

'Does it come in your knob,
Then,' says he, 'Mister Snob,
That I've just come to give you a bit of a job?'
Says he, 'Then I'm ready, what is it?' says he,
Still thumping away at the boot on his knee.
'All commands I attend,
Understandings to mend.'
'O, no,' says the other,
'Don't get in a bother,
For this is a *mis*-understanding my friend.
It's aisy enough,
For I'll find you the stuff,
You see I've a cow-hide that's rather too rough:
Now you may understand
How the thing I have plan'd;
As you have a sheep-skin that wants to be tann'd,
We'll put them together,
And ascertain whether
Your sheep-skin will come out prunella or leather!'

Then the man with the boot gave a whistle, and then,
Went thumping away at his lap stone again.
'Rat-a-tat-tat,
The fiddle and cat,
The kitten jumped over and fell in the fat!'
Don't whistle, sir, while I am talking.'
Said he who first so fast was walking,
That pretty voice you'd better keep
To sing the old dead cow to sleep
Sir, you're a blackguard, every inch,
And you're not worth a half a pinch,
Of Irish Blackguard; do you hear;
Come to the street,
If you want to be beat,
And I'll give you a nate little whipping, my dear!'
Rat-a-tat-tat—
There the man sat!
'I don't like the bargain at all, Mister Pat;
One whipping from you
Will not, certainly, do,
For I wouldn't get up and go out, sir, for *two*!
As for your cow-*hide*,
And your sheep skin beside,
'Tis wasting your illigant language to speak,
For I'm busy to-day,
And have no time to play
With a donkey at *hide* and go seek!'

Then,—O, shocking to relate!—
Then the pair went at it straight!
And a tailors' measuring stick,
Three feet long and six feet thick,
Fell, with murderous action, quick
On the cobbler's caput click!
Rat-a-tat-tat—
'Is it that you are at?
Then the same to yourself, and long life, Mister Pat!
And the cobbler struck a lick,
Or, more properly, a *kick*,
As it was the boot he sent
To return the compliment!
'Tit for tat,'
Then says Pat,
'I'm your servant for that,'
And at it they went again,
Rat-a-tat-tat!

'There's another,' says Pat,
'Just to swell the amount;'
Says the cobbler, 'Take that,
Just to FOOT the account;'
And faster and thicker,
And bolder and quicker,
Went the kick and the lick
'Tween the boot and the stick.
Rat-a-tat-tat—
Bang went the boot, and the tailor went flat!

Up again, down again, over and under,
Hugging each other and jumping asunder,
Such was the racket, it isn't a wonder,
All the deaf neighbors were thinking of thunder!
The battle waxed warmer,
And warmer the *wax*,
O, 'twas *melting* to see it
Employ'd in attacks.
And next the yard-stick gave
The cobbler a fall,
And falling, he flung at
The tailor his *awl*.
And then went the hammer,
And next flew the tacks
And the boot and
The awl and the wax.
Till, lastly, the cobbler, upon his last legs,
Went *pegging* away from a keg of his pegs.
Rat-a-tat-tat—
And there ended the rout,
For away went the *last!*
And the tailor *cut out!*

Men will differ, so will maids,
About love, as well as trades.
'Tis a pity, so it is,
That a pretty woman's phiz,
Should make men fall in and out,
And knock each other all about!
For hence arise
Bung'd-up eyes,
And, O, Moses!
Bloody noses!
Here was a boot-maker bootless,
And a bold costumer, fruitless,
Meddling with each other's matters,
Tearing linen all to tatters,
Scouting, flouting,
Each the other,
And, without any reason
In the world, making
All this bother.

Now, the cause of all the row
Was, what takes full often place,
And we'll only whisper now,
There was 'a lady in the case!'
And her heart, pit-a-pat,
Went rat-a-tat-tat—
For one of the chaps,
Or both perhaps.
But saith not the rumor,
Which one was the gainer,
The gallant Costumer,
Or jolly Cordwainer,
So leave them to glory,
And peace, and all that.
And so ends the story
Of rat-a-tat-tat.

The Agency of Otis's Mortising Machine, is at 115 Walker street, and not 119, as our types erroneously made it last week.

Big Potatoe.

"One of our exchanges speaks of a parent potatoe raised in Pittsfield, Ohio, and measuring two feet and three inches in length. They must have a long pot to boil it in."—[Scientific American.

Now, Mr. Rufus Porter, we really supposed that you, and every other intelligent Gothamite, well knew that such a potatoe as the one noticed, could not be raised in the Buckeye State. We hope you will make the proper correction, and render the credit due to the fertile soil of Suckerdom. And now as we expect to take leave of the subject of Big Sweet Potatoes, for the season, we will recapitulate, for the benefit of all whom it may concern, as follows:—

Sweet Potatoes raised by R. W. Scanland of Pittsfield, Illinois, furnished to and noticed in the Free Press, of September 17th, 24th, and October 8th.

Long—2 feet 3 inches.

Longer—3 feet one inch.

Longest—4 feet 10 inches, weighing 62 *oz.* and averaging half a foot in circumference for three and a half feet of its length.

We believe there is no Pittsfield in *Ohio*, and if there were, no one can suppose that the town could turn out such potatees as the above. —[Pike County (Ill.) Free Press.

Three potatoes measuring ten feet and four inches in length, besides the circumference, 'furnished'—presented of course—to an editor. It is no wonder our Western exchanges contain such big stories. We are glad the error above alluded to occurred, or we should not have been thus edified on the subject of Suckerdom fare.

Reward for Vigilance.

We learn from a late continental journal, that the Government of Austria, with a wise provision against accidents incurred on railways, has issued an ordonnance declaring that every engine driver on the rail-road of the State who shall have for the space of one year, performed his duties without any accident, shall be entitled to a reward of 100 florins, and that every engine driver whose trains have met with no accident for ten consecutive years, shall receive 1,000 florins and a gold medal.

The Want of Caution.

It has often been remarked that Americans are usually reckless when employed in dangerous business. An instance of this recently occurred near Albany, wherein a man engaged in blasting rocks, set fire to the fuze, and leisurely retreated but a few steps, when the charge exploded, and a fragment of rock struck him, causing instant death.

Enterprise in Portland.

A stock company has been suddenly formed in Portland, for the purpose of establishing the business of manufacturing railroad iron, locomotive engines and railroad cars. One half of the required capital was subscribed on the first evening. We are glad to see a little fresh enterprise springing up in Portland, for we think the city has been times-ridden long enough.

An Honest Editor.

One of the editors of that bright and excellent paper, the "Gem of the Prairie," published at Chicago, Ill., is entitled to our thanks for an example of promptness in credit giving, far beyond what we practice ourselves, or expect from others.

Rather Pointed.

The Maine Enquirer says, "a late number of the Lowell Niagara contained an *editorial* article which *we* were very much pleased with. In truth, we were in excellent humor when we wrote that article, some three months ago!" We have had many opportunities of making similar remarks, if we had only thought of it.

A Hundred New States.

It is said that the Oregon Territory belonging to the United States is sufficient to make 100 States, as large as Delaware and Rhode Island.

The Paymaster General, contradicts the current rumors of the destitution of our armies in Mexico, and says, the soldiers have been promptly paid.

Great Pacific Railroad.

There has recently been a large meeting at the room of the Board of Trade, Pittsburgh, to hear an explanation, from Asa Whitney, Esq., of his project to connect the Atlantic and Pacific Oceans by railroad.

Mr. Whitney addressed the Board, and presented fully his plan: showing its feasibility, and asked the co-operation of the citizens of Pittsburgh and its vicinity in petitioning Congress for the passage of a law to carry out his project.

A committee of five was appointed to prepare a report and memorial to Congress, on the project.

A glance at any map of the world on Mercator's projection, exhibits the United States directly between the Western shore of Europe and the Eastern shore of Asia, and therefore as part of the shortest route between the two shores.

A line between Liverpool and Canton, across the United States, is almost straight, and is shorter than any other practicable commercial line between these two ports of Europe and Asia. This railroad will be the route, and over it will Europe travel to Asia, for its commerce.

The distance by this route from Liverbool to Canton, is 13,000. The distance around the Cape of Good Hope, is 17,000. A difference of 5,000 miles in favor of the route through the United States. Six months is now the shortest period allowed for a passage from Liverpool to Canton. By this route the time will be reduced to *forty-five days*.

The Great Reservoir,

We noticed some time since, that the Lowell Companies had secured command of the outlet of Lake Winipiseoga, in New Hampshire. It is now reported, that nearly the whole supply of water employed at the Lowell Mills, is drawn from that Lake, and without which, the Merrimack river would have been nearly dry.

Great Hypocrisy.

Now that the Mormons have been literally driven out of their city, and of the State by armed mobs, Governor Ford has decided to send 111 men to put down the anties.

Coughing.

According to a writer in *Le Gazette Medicale*, nervous coughing may be prevented by rubbing pretty smartly the end of the nose with a brick. Comical cure that—especially to take to church with you.

The letter A in favor.

Queen Victoria's first name is Alexandrina; that of her husband Alfred, and their four children are named Adelaide, Albert, Alice and Alfred.

Monster Apple.

The Tribune speaks of a fine red apple, which measured 15 inches "from the snout to the tip of the tail," from which we infer that it must have had a very long tail.

Doubling Crops.

A successful experiment has been made of grafting the tomato upon the stalk of a potato, thus raising *tomatusses* and *potatusses* from the same hill. We should think it rather small business.

The Three Mile Picture, the great painting of scenery on the Mississippi, by Barnard, is completed and now on exhibition at Louisville. It embraces the entire scenery from New Orleans to the mouth of the Missouri.

There are in Paris, says the Edinburgh Weekly Register, myriads of little newspapers scarcely bigger than a sheet of letter paper, which exist only on defamation and scandal.

The new steamer Isaac Newton, made the run from Four-Mile Point to Poughkeepsie—distance 54 miles—in two hours and eight minutes.

Mr. Baer, the Buckeye Blacksmith, is engaged in taking Daguerreotype portraits, in Alexandria, Va.

We refer our readers to the advertisement of "Branwhite's Patent Color Discriminator," in another column.

Let him who makes himself a sheep, beware of the wolves.

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Information to persons having business to transact at the Patent Office.

Continued from No. 6.

FORM OF SPECIFICATIONS.

SEC. 72. When the application is for a machine, the specification should commence thus:—

Be it known that I, of in the county of and State of , have invented a new and useful machine for—[stating the use and title of the machine; and if the application is for an improvement, it should read thus: a new and useful improvement on a, or on the machine, &c.]—and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which figure 1 is a perspective view, figure 2 a longitudinal elevation, figure 3 a transverse section, &c. [thus describing all the sections of the drawings, and then referring to the parts by letters.] Then follows the description of the construction and operation of the machine, and ending with the claim, which should express the nature and character of the invention, and identify the part or parts claimed separately or in combination. If the specification is of an improvement, the original invention should be disclaimed, and then the claim confined to the improvement.

FORM OF OATH.

SEC. 73. COUNTY OF HAMPDEN,
State of Massachusetts, ss:

On this day of 483 , before the subscriber, a , personally appeared the within named Sebastian Cabot, and made solemn oath [or affirmation] that he verily believes himself to be the original and first inventor of the mode herein described for preventing steam-boilers from bursting, and that he does not know or believe the same was ever before known or used; and that he is a citizen of the United States.

A B.

FORM OF WITHDRAWAL.

SEC. 74. To the Commissioner of Patents:

Sir: I hereby withdraw my application for a patent for improvements in the steam-boiler, now in your office, and request that twenty dollars may be returned to me agreeably to the provision of the act of Congress authorizing such withdrawal.

SEBASTIAN CABOT.

Cabotville, Mass., March 1, 1838.

N. B.—If you withdraw your application, please enclose a receipt in following form:

Received of the treasurer of the United States, per Hon. Edmund Burke, Commissioner of Patents, twenty dollars, being the amount refunded on withdrawing my application for a patent for

FORM OF SURRENDER OF A PATENT FOR RE-ISSUE.

SEC. 75. To the Commissioner of Patents:

The Petition of Sebastian Cabot, of Cabotville, in the county of Hampden, and State of Massachusetts.

Respectfully Represents:

That he did obtain letters patent of the United States for an improvement in the boilers in steam engines, which letters patent are dated on the first day of March, 1835. That he now believes that the same is inoperative and invalid, by reason of a defective specification, which defect has arisen from inadvertence and mistake. He therefore prays that he may be allowed to surrender, and he hereby does surrender the same, and requests that new letters patent may issue to him for the same invention, for the residue of the period for which the original patent was granted, under the amended specification herewith presented; he having paid fifteen dollars into the Treasury of the United States, agreeably to the requirements of the act of Congress in that case made and provided. SEBASTIAN CABOT.

FORM OF ASSIGNMENT OF A RIGHT IN A PATENT.

SEC. 76. *Whereas*, I, Sebastian Cabot, of Cabotville, in the county of Hampden, and State of Massachusetts, did obtain letters patent of the United States for certain improvements in steam-engines, which letters patent bear date the first day of March, 1835; and whereas, John Doe, of Cabotville, aforesaid, is desirous of acquiring an interest therein: *now this indenture witnesseth*, that, for and in consideration of the sum of two thousand dollars, to me in hand paid, the receipt of which is hereby acknowledged, I have assigned, sold, and set over, and do hereby assign, sell, and set over, all the right, title, and interest, which I have in said invention, as secured to me by said letters patent, for, to, and in the several States of New York, New Jersey, and Pennsylvania, and in no other place or places The same to be held and enjoyed by the said John Doe, for his own use and behoof, and for the use and behoof of his legal representatives, to the full end of the term for which said letters patent are or may be granted, as fully and entirely as the same would have been held and enjoyed by me, had this assignment and sale not have been made.

In testimony whereof, I have hereunto set my hand, and affixed my seal, this first day of March, 1838.

SEBASTIAN CABOT, [L. S.]

Witness: { A. B., C. D.

FORM OF DISCLAIMER.

SEC. 77 To the Commissioner of Patents:

The petition of Sebastian Cabot, of Cabotville, in the county of Hampden, and State of Massachusetts.

Respectfully Represents:

That he has, by assignment, duly recorded in the Patent Office, become the owner of a right for the several States of Massachusetts, Connecticut, and Rhode Island, to certain improvements in the steam-engine, for which letters patent of the United States were granted to John Doe, of Boston, in the State of Massachusetts, dated on the first day of March, 1835. That he has reason to believe that—through inadvertence and mistake—the claim made in the specification of said letters patent is too broad, including that of which the said patentee was not the first inventor. Your petitioner. therefore, hereby enters his disclaimer to that part of the claim in the aforenamed specification, which is in the following words: "I also claim the particular manner in which the piston of the above described engine is constructed, so as to insure the close fitting of the packing thereof of the cylinder, as set forth: which disclaimer is to operate to the extent of the interest in said letters patent vested in your petitioner, who has paid ten dollars into the Treasury of the United States, agreeably to the requirements of the act of Congress in that case made and provided.

SEBASTIAN CABOT.

When the disclaimer is made by the original patentee, it must, of course, be so worded as to express that fact.

FORM OF CAVEAT.

SEC. 78. To the Commissioner of Patents:—

The petition of Sebastian Cabot, of Cabotville, in the county of Hampden, State of Massachusetts,

Respectfully Represents:

That he has made certain improvements in the mode of constructing the boilers of steam engines; and that he is now engaged in making experiments for the purpose of perfecting the same, preparatory to his applying for letters patent therefor. He therefore prays that the subjoined description of his invention may be filed as a CAVEAT, in the confidential archives of the Patent Office, agreeably to the provisions of the act of Congress in that case made and provided; he having paid twenty dollars into the Treasury of the United States, and otherwise complied with the requirements of the said act.

SEBASTIAN CABOT.

Cabotville, March 1, 1838.

SEC. 79. Here should follow a description of general princicles of the invention, so far as it has been completed.

FORM FOR ADDITION OF NEW IMPROVEMENTS.

SEC. 80. To the Commissioner of Patents:—

The petition of Sebastian Cabot, of Cabotville, in the county of Hampden, and State of Massachusetts,

Respectfully Represents:

That your petitioner did obtain letters patent of the United States for an improvement in the boilers of steam-engines, which letters patent are dated on the first day of March, 1835; that he has since that date, made certain improvements on his said invention; and that he is desirous of adding the subjoined description of his said improvements to his original letters patent, agreeably to the provisions of the act of Congress in that case made and provided; he having paid fifteen dollars into the Treasury of the United States, and otherwise complied with the requirements of the said act.

SEBASTIAN CABOT.

(To be continued.)

The Philosophy of Illumination.

If this subject is not strictly mechanical, it will at least be interesting to many mechanics, who are engaged in the construction of lanterns, reflectors, and other means of illumination, and methods of modifying and applying light, either natural or artificial. Light, when emanating and radiating from the flame of a lamp, or other luminous body, decreases in density as it recedes from its source, in proportion to the squares of the distances through which it travels. To illustrate this we will suppose two equal lamps to be placed each in the centre of a hollow globe or sphere, one of which is ten inches, and the other twenty inches in diameter. Then of course, the interior surface of one globe is four times as large, or contains four times as many square inches as that of the other, it is plain that each square inch of the larger surface, can receive but one-fourth part as much light, as an inch of the surface of the smaller globe, although the distance of the former is but double that of the latter. It does not appear that the quantity of light is diminished by any distance, but merely becomes less dense by the expansion of radiation. Many attempts have been made,—but in vain of course—to increase the quantity of light, emanating from a luminous body, by means of reflectors and refracting glasses; but it may be regarded as an invariable law that whenever light is increased on one spot, or in one direction by means of reflectors or refractors, it is equally diminished in other directions, and may be considered as borrowed from one point to supply another. This, however, is frequently advantageous, as the rays of light are thus turned from directions in which they would be of little or no service, to others in which they are useful.—By a properly adjusted concave reflector, at least three-fourths of the light proceeding from the flame of a lamp, may be converged to one direction, and concentrated on one spot of almost any required dimensions. All bodies which are illuminated, or on which a luminous body is said to shine, reflect a part of the light in opposite directions; but a larger proportion is reflected by white, or light colors, than by black. *Refraction* of light is produced by means of the oblique surfaces of transparent bodies, through which the light is made to pass. By a law of nature, the direction of rays of light are bent from their ordinary direction by passing through an oblique surface of any transparent body; and this variation of direction, being in some measure proportionate to the obliquity of these surfaces, glasses of unequal surfaces are used to converge the rays as occasion requires On this principle is based all the various phenomena of telegraphs, microscopes, and burning glasses.

Development of Wealth.

It must be evident to the sagacious observer, that the period has already arrived when the mines of the United States are becoming to its present population, what the most select and fertile soil was to the first settlers, namely, the foundation of permanent wealth to the projectors and their children.

As an instance of this, men of middle age can well remember when the anthracite coal lands of Pennsylvania could all have been purchased for a trifle; and yet these same lands, so recently esteemed worthless, have sent two millions of tons of coal to market the present year, and have yet in store vast deposits of the same fuel, to give warmth, illumination, and motive power to generations yet unborn.—[R. R. Journal.]

Liberality in the East.

Ibrahim Pacha has given their freedom to all his white slaves, with permission to leave Egypt if they thought it better for their interests to do so, or to remain with him if they preferred it.

NEW-CANAAN, CT., Oct. 26, 1846.

Mr. Ediior:—

Sir: If you will please be kind enough to explain through your paper, what is meant when we hear persons say that such a water wheel is of fifty or sixty horse-power, as the case may admit, you will confer a favor on many.

I for one, have asked many a time, "what is horse power?" And as yet, have not been able to obtain an answer.

If it be, sir, a mathematical term of a certain quantity of power,—its momentum and the application of the term (horse-power,) would be interesting to the greater share of the readers of the Scientific American.

Yours, Respectfully,
J. F.

Our correspondent has probably not seen the early numbers of this paper, or he would have found his enquiries already answered. Every specification of quantity of power, must imply time and motion as well as force. A force or pressure of 100 pounds, with motion equal to 330 feet per minute, constitutes what is called an English horse-power. In America there is no scale established by law, defining quantities of power, though the subject has been neglected by Government much too long, already. What is usually called a horse-power in this country, is about equal to raising 100 lbs. 200 feet per minute. The common expression concerning certain water-wheels, that they are of so many horse-power (without reference to a specific quantity and fall of water,) is an improvement on sheer nonsense. In overshot wheels, however, by which both the fall and quantity of water are limited to the diameter of the wheel and the capacity of the buckets, there may be some apparent propriety in the expression, if its dimensions are understood:—not otherwise. A new cast-iron water-wheel, which was exhibited at the late Fair in this city, was reputed to work *twelve horse-powers*. We had the curiosity to make some little estimate of its capacities, and found that to work that amount of power, it would require upwards of a hundred feet head or fall of water.

With regard to a scale of definite quantities of power, let every mechanic adopt the following, that it may become general, whether established by law or not.

Let the unit of power be that quantity that will raise one pound 100 feet per minute—and let this quantity be called 1 lb. of power, or more properly, one power (1 pr.) Then we shall have 50 pr., 100 pr., 1000 pr. &c. Instead of estimating a steam engine at ten horse powers, we should write 3300 pr. Many mistake force for power, and talk about *lever power*, &c., although no power can be gained by levers, pulleys, nor geer wheels. Force is simple pressure without regard to motion:—power consists of both force and motion, and each must be specific in order to constitute specific power.

Telegraph Improvement.

Much has been said on the subject of the difficulty of extending telegraphic communications across broad rivers. Mr. Cornell, the Superintendent of the New York and Buffalo line, has been studying, for a year or two, with a view to overcome this serious obstacle to a continuous connection. His reflections have resulted in what he deems to be a practicable discovery. He tested his project on Tuesday, and it resulted, he assures us, to his entire satisfaction. What his discovery is, he does not choose, at present, to inform the public—except that the connection is secured through a naked wire placed in the water. Those who are aware that water is among the very best conductors of electricity, will question Mr. C.'s veracity, until they learn more of the details of his discovery. But of this the public may rest assured — the experiment has been successfully made, and under circumstances which promise permanent utility.—[Albany Eve. Journal.

Largest City in the World.

There is a city in the interior of China called Sou Tchou, which has a population of five millions within its walls, and ten millions within a radius of four leagues around. Mr. Hedde, a French missionary, who had visited it, is given as authority for the statement.

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NEW INVENTIONS.

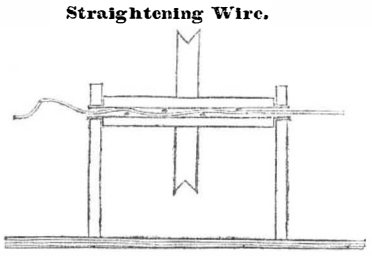
Improved Raker and Cleanser.

Messrs. J. and L. Himblay, of Huron, Ohio, informs us that they have built and put in successful operation, a portable raker and cleanser of grain, which is pronounced by good judges to be superior to anything of the kind in use. The machine stands on a waggon and separates the grain from the straw and chaff, and runs the wheat into bags ready for market. They employ eight horses, and can thresh and clean *sixty bushels per hour.* The inventors intend applying for a patent soon, when we shall give a particular description of this machine.

New Parlor Stove.

Mr. D. B. Thorp, 123 Water street, has introduced a stove which for elegance combined with utility and economy, is said to surpass any thing in that line. It is so constructed as to furnish a very uniform degree of heat, from anthracite coal, while it presents all the cheerfulness of appearance that is found in the grate or open fire place. We cannot fully describe its construction with an engraving.

Straightening Wire.



Clock makers and others who use iron and brass wire, sometimes have found it difficult to restore the wire to the perfect straightness required for nice work: but the simple little machine represented in the cut, has the effect to straighten the wire with perfect facility, removing not only the ordinary curve occasioned by coiling, but all other accidental crookedness therein. The machine consists of a small hollow shaft, generally made of wood, and having its bearings in two posts of convenient height, and centrally a pulley to receive a band or belt from a drum or band-wheel, whereby to give the shaft a rapid rotary motion. Four or more pins are passed through the shaft at such distances and positions, that the wire being passed through the hollow of the shaft, and passing over and under these pins alternately, as represented in the cut, (which is drawn sectionally for the purpose of showing the position of the pins and wire,) it becomes a little sprung or bent by the pins. When the shaft is put in motion, this wire may be drawn through it rapidly, and will be found straight as a drawn line, and free from all crooks or curves. The pins may consist of short pieces of wire crossing the hollow of the shaft, near its centre.

A Clock on a new Plan.

Galignani mentions that a watchmaker of Paris has constructed a clock of a curious and most ingenious nature. It is made with eleven dials. The principal dial shows the hours alone; a transparent one immediately below the former, shows the progression and retrogression of the sun; two others, also transparent, and through which the mechanism of this immense machine can be seen, mark, the one the days of the month, the other the seconds. Eight square enamelled dials are arranged round the two sides of the pendulum, and show the hour in each of the following cities: London, Algiers, Alexandria, St. Helena, Otaheite, Canton, New York, and St. Petersburg. Each of these dials is marked with 24 hours, instead of 12, so as to show the hours of the day and those of the night. Lastly, the pendulum carries a large metrical scale indicating the degree of contraction and expansion of metal. The clock cost 14,000 francs, or about £600.

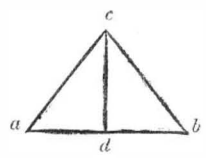
A Mexican Express.

Captain Beach, of the schooner H. Plantagnet, at New Orleans, says that the news of the battle of Monterey was known to the Mexican citizens at Matamoras, at least thirty-six hours ahead of the United States Express. The Mexican vedue was probably better acquainted with the roads, besides being safer in travelling.

MENSURATION.

To find the Area of a Triangle.

Rule: Multiply one of the sides *c a* or *c b*, by the perpendicular *c d*, and one half the product will be the area. Or multiply the perpendicular *c d* by one half the base *a d*, and the area.



To find the area of a Trrangle of irregular sides, from the lengths of its sides, without knowing the perpendicular.

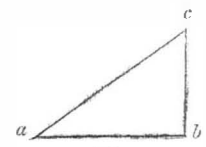
Rule: Add together the lengths of the three sides, and from one half of the sum thereof, subtract each of the three sides separately.—Then multiply the half sum into each of the three remainders, and the square root of the last product will be the area.

Example: The three sides of a triangular lot of land are 134, 108 and 80 rods, what is its area?

The product of the three sides is 322, which divided by 2 is 161. Then from 161 subtract each of the sides separately and the remainders are 81, 53 and 27. Multiply the half product 161 and each of the remainders together, and the product is 18661671, the square root of which is 4319 square rods.

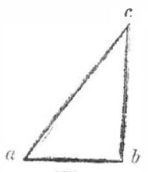
To find the Hypotenuse c a of a right angled Triangle a b c, when the base a b and the perpendicular c b are known.

Rule: Square the base and the perpendicular, that is, multiply each into itself, and add the two products together. The square root of this sum will be the hypotenuse sought.



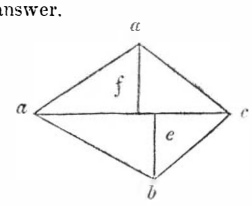
To find the Perpendicular c b, when the Base a b and the Hypothenuse c a are known.

Rule: Square the base *a b* and the hypotenuse *c a* and subtract one square or product from the other, and the square root of the difference or remainder will be the perpendicular *c b*. The same rule will apply in finding the base when the perpendicular is known.



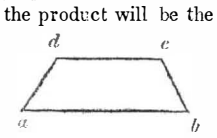
To find the area of a Trapezium, or irregular four sided figure.

Rule: Divide the trapezium into triangles by drawing diagonals *a c*, *d e* and *f b*. Then ascertain the area of each triangle by the rule above given, and the sum of all the areas will be the answer.



To find the area of a Trapezoid, a b c d.

Rule: Add together the lengths of the two parallel sides *a b* and *d c* and multiply this sum by the perpendicular distance between the two sides; the product will be the area.



Draper's Grand Acolichord.

Mr. Draper has one of these extraordinary instruments at his rooms at Dr. Jones's, 383 Broadway, at which place those who feel interested are invited to call and examine it. We are in hopes Mr. Draper will soon announce a public concert, at which the lovers of music will have a chance to hear as well as see this incomparable instrument.

CHEMISTRY.

LAWS OF CHEMICAL COMBINATION AND DECOMPOSITION.

There are various laws connected with, and phenomena attendant upon, chemical attraction. While, of course, it can operate only between bodies of a different nature, when qualities which characterize these bodies when separate, are changed or annihilated by their combination, and it takes place only between the atoms or most minute particles of bodies. Chemical attraction can take place between two, three, or even a greater number of bodies. A change of temperature is almost always observable at the moment of combination. The force of chemical affinity between the constituents of a body, is estimated by that which is requisite for their separation. It has been already remarked that the degree of attraction varies very considerably in different bodies; and it is evident that from this variation all chemical compositions and decompositions take place. The preference of uniting with another substance which any given body is found to exercise, is metaphorically termed *elective attraction*, or *affinity*. It is of two kinds, each of which derives its appellation from the number and the powers of the principles which may be brought into contact with each other. When a simple substance is presented to a compound one, and unites with one of the constituents of the latter, so as to separate it from that with which it is combined, and by this means producing a decomposition, it is said to be effected by *simple elective attraction.* Some substances, however, will not be thus easily decomposed; and it is found necessary to introduce two or more principles, in order to effect the end in view. When two principles, therefore, are presented to a compound body, and when the principles unite each with one of those of the compound substance, two new substances are formed; and all instances of decomposition in this manner are said to be effected by *double elective attraction.* It is to be observed, that all changes effected in this manner are permanent, and that the new compound thus formed, cannot be decomposed, until a substance having a more powerful affinity for one of its constituents than they have for each other, is brought into contact with them.

To Sir Isaac Newton we are indebted for the first attempt at a rational explanation of chemical combination. He was of opinion that the minute atoms of certain bodies attract each other with an unknown but enormous force, which begins to exert itself only when the particles are at very small distances from each other, and that, accordingly, this force exerts itself, and the bodies unite, when they are brought within the requisite distance. These views slowly made their way into the science; but towards the middle of the eighteenth century, they seem to have been almost universally adopted. The term chemical affinity was substituted for that of attraction, and the strength of the affinity existing in bodies came to be measured according to the order in which they were decomposed. It is unnecessary to mention the various tables of affinity which were published previously to that of Bergman, who in 1775 gave to the world a copious table of affinities, and appears to have fixed the opinions of chemists in general to his own views of the subject. According to this philosopher the affinity of each of the bodies, say *a, b, c, d,* for *x*, differs in intensity in such a manner, that the degree of affinity in each may be expressed by numbers. He supposed affinity to be elective, in consequence of which, if *a* have a greater affinity for *x* than *b*, if *a* be presented to the compound *b x*, a decomposition will ensue, *b* will be set at liberty, and the compound *a x* will be formed.

THE ATOMIC THEORY.

This theory was not discovered all at once, and immediately acknowledged by chemists; it was gradually brought to light by the repeated experiments of successive philosophers, whose labors, however, it will be impossible to exhibit a view of in this place. To Mr. Dalton we are indebted for the first developement and demonstration of the fact, that bodies unite in definite proportions; and of which we shall now attempt to present the reader as clear and simple a view as possible. Whilst engaged in determining the composition of the wo gases called severally carbureted hydrogen and olefiant gas, Mr. Dalton discovered that for complete combustion they require *different* but *determinate* quantities of oxygen gas.—A volume* of carbureted hydrogen requires two volumes, whilst a volume of olefiant gas requires three volumes of oxygen gas.

The conclusions at which Mr. Dalton arrived are, that bodies consist of atoms incapable of further diminution or division; that in chemical combinations it is these ultimate particles which unite; and that, in the case above mentioned of the combustion of the two inflammable gases, carburetted hydrogen is a compound of one atom of hydrogen and *two* atoms of carbon. The atoms he considered as spheres and represented by such symbols as a circle with a dot in the centre, a circle with a vertical diameter and the like. In this manner the composition of a number of the best known bodies was represented by him, and the ratios of the weight of the atoms of the simple bodies inferred. For instance, he concluded from his experiments that carburetted hydrogen is composed of, hydrogen one, and carbon five; while olefiant gas is composed of, hydrogen one, and carbon ten. Now, as the former gas consists of one atom of hydrogen and one of carbon the weights of these atoms are to each other in the relation of one to five. If the weight of the atom of hydrogen, therefore, be represented by one, that of carbon will be five. In this manner the ratios of the weight of the atoms of all the simple bodies may be ascertained by a careful analysis of the compounds formed by the union of the simple bodies.

The combiantion of mercury or quicksilver with some other bodies, affords an illustration of the theory. Its first compound with oxygen, one of the gases of which the atmosphere is composed, consists of two hundred and two parts of mercury and eight of oxygen If, however, the metal be subjected to a considerable degree of heat, it will be converted into a red shining mass, which is also a compound of the metal with oxygen: but in the latter case, sixteen parts of oxygen have united with the two hundred and two parts of the metal. The explanation of this is, that eight is the chemical equivalent of oxygen, and two hundred and two of mercury. In every successful compound which they make, their proportions form a multiple of these equivalents. Every other simple body has, in like manner its equivalent number, and to its compounds the same rule applies. Innumerable instances of this might be adduced, but these are sufficient to prove the remarkable truth, that when different substances combine with chemical attraction, the proportion of the ingredients are uniform; that for every atom present of one substance, there is exactly one, or two, or three, &c. of the other. If, for instance, any quantity of sulphur, intermediate between the two combinations of that substance with mercury, be added, it will not combine with it, but remain as a foreign ingredient in the sulphuret of mercury, as the compound is termed. All bodies, however, do not unite in several proportions, thus giving rise to several distinct compounds from two elements; there are many elementary bodies which will only unite with each other in one proportion, so that any two of such substances can only form one compound. This law, however, is not universal, as it is well known that water and alcohol, and water and sulphuric acid, will unite in any proportions. Water will also unite in any proportion with soluble salt, until it becomes completely saturated. Bodies which unite in any proportions form an infinite variety of compounds, and are distinguished by their being united by a weak affinity, and also by the compounds formed differing little from their simple constituents, or from each other.

These remarks must be held as applying to inorganic chemistry chiefly; vegetable, or organic chemistry, presents many exceptions to the principles of combination now laid down.

* Volume, in chemistry, is a term employed to denote any quantity in bulk of a substance. It is usually applied to the gasses. Thus, one volume of hydrogen gas is, say, a cubic foot, yard, or any other quantity; then two volumes are of course just double the cubic foot, yard, or whatever other quantity previously mentioned.

To be continued.

Dobbs, the portrait painter, on being asked what was virtue—replied, "any thing that you would approve at midnight, with a thunder storm raging over your head."

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NEW YORK, NOVEMBER 6, 1846.

Townsend's Invention.

Our readers will readily see and appreciate the utility of the invention presented on our first page, and which we have noticed in a former number. We have a remark to make, however, on the subject of its present insertion. After having been furnished with the engraving we were about to decline its insertion, on account of its having appeared last week in the "Farmer and Mechanic," claiming as we do, the first right to notices of new inventions; but by a subsequent letter from the inventor, we are assured that the insertion of the article in that paper was wholly unauthorized, and contrary to a special request, on his part, that the notice or description should *not* appear in that number. The publisher of that paper will probably give some explanation of the apparent breach of confidence.

The origin of the Wandering Boys.

Our readers do not often find anything theatrical in our columns, but having several years since witnessed and admired the play entitled " the Wandering Boys," we feel some interest as well as surprise in learning its origin, which we find explained in the following article in the Sun, of which Major Noah is one of the editors.

" The ' *Wandering Boys*,' was performed last night at the Park. The cognomen we think very appropriate, as the play has been travelling about the world for more than thirty years, without any knowledge of its parentage being hinted at. The name was formerly " Paul and Alexia, or the orphans of the Rhine." It was written for two ladies of Charleston, in 1812, by Major M. M. Noah.—The ladies' names were Mrs. Clark and Mrs. Young, both actresses very accomplished and very pretty. No sooner had the play reached England, than the English managers, (English like) changed the original name to that which it now bears, and it then returned to the United States, where it has since that time been performed in every city in the Union, without the slightest idea of its American origin."

Scientific American.

Tee-total as we are both in principle, and in practice, and recusant as we should be on any account to swallow a particle of the "cat's broth," known as "Albany Ale," — still we confess a fondness for *that* kind of New York *Porter*, which has been for a long time, and continues to be hebdominally placed upon our Cataractorial table by that useful " *Scientific American*," that has recently rigged himself out "from top to toe" with a new, and elegant quarto suit of typographical robes which he very becomingly wears both as the *guerdon* of his past, and the *guaranty* of his future *newspaperial* labors.—[Massachusetts Cataract.

Thank you, friend Goodrich, not only for the compliment, but for the many *Good-rich* paragraphs which we occasionally *hook*—bite or no bite,—from the *ascending Cataract*.

The two Montereys.

Some of our correspondents are puzzled at our reports of naval operations and land victories at Monterey, Now, be it known to all men and women, who will look on the map of Mexico, that there are two Montereys in the enemy's country. One is in north-eastern Mexico, it is an inland city, and is now in possession of Gen. Taylor. The other is in California; is a seaport on the Pacific Ocean, and is now in possession of Commodore Stockton. When we speak of the army of Monterey, therefore, we mean Monterey in the interior; and when we speak of ships of war at Monterey, we mean the city of that name on the west coast. Buy a map of Mexico, gentle reader, and then you will know exactly the positions of our army and navy.—[Sun.

The Montreal Herald rejoices at the prospect of a speedy communication by railroad between Montreal and the Atlantic cities.

[For the Scientific American.]

Mechanical Health.

The human frame is a machine whose architect is a Creator of infinite wisdom. In order to have it operate to perfection, every part must be in the place and perform the office designed by its contriver and maker. No class of the community should be more sensible of this than mechanics. They well know that those parts, in a machine, designed to be perpendicular or horizontal, cannot vary from these directions without impairing its strength and efficacy. Every additional part must form and retain its own peculiar and appropriate angle in relation to the others. The same is true in reference to all those parts the forms of which vary from the rectilinear. They must not only have and preserve their own angle or place, but they must be made with such accuracy that their motions will be uniformly the same. Take a watch, for instance. How true and faithful in its performance! As long as its well made parts continue in order, its language is understood and credited. As soon as one part becomes weakened or misplaced, all the others sympathise with it and refuse to work. If this is the case with the productions of human mechanism, is it not equally so with that wonderful and complex machine—the human frame? Every mechanic well knows that a machine requires to be carefully used and well watched lest some portion get out of order. With the best of attendance, how often does one part become misplaced or give way, and either stop the whole machine or completely destroy it.

Familiar as are mechanics with the requisites of machinery, is it not surprising that they so frequently violate the known laws of mechanism in relation to their bodies? They act as though the parts having their relative place and angle could permanently assume other positions without serious violence and injury to a machine that could have been made only by infinite wisdom. Although they know that the natural position of the body is erect, yet how common is it to see the parts in the region of the shoulders and chest out of their natural places. Do they suppose that all this can take place without materially deranging the whole system, marring its beauty and lessening its efficacy! Can all this occur without misplacing almost every member and interior part of the whole body? Can the lungs perform equally well their wonderful functions? Can the heart, that steam engine of the body, do its work equally well? Will there not be friction and most shameful and serious injury throu hout the whole system? Is there not imminent danger of breaking and bursting?—If so, how can a mechanic be seen walking the street with crooked shoulders and compressed chest? If his work has required a bent and crimped posture, why does he not, when he goes forth, right up his machinery, bring all the bones and muscles to their places, expand his chest, inhale full volumes of air, and thus drive away all incipient diseases?—Why does he not look upon his wife and his children with a mechanical eye? Why does he not watch over his offspring, see that every limb, bone and muscle are developed, and counteract all the effects of custom and fashion? How much less suffering would there be if more attention was paid to mechanical health! By this means alone the condition of the human family would be greatly elevated.

S. F.

Thanksgiving.

About a dozen of the Governors of different States have fixed on the 26th, as a day of Thanksgiving. It appears to us very inappropriate, however, to appoint the most gloomy and disheartening season of the year, for thanksgiving, and days of fasting, in the merry spring. Let the Governors reverse the custom,—appoint days of fasting and prayer at the approach of the gloomy and much dreaded winter; and days of thanksgiving about the first of May, and each occasion would be observed much more heartily than at present—though the wealthy producers, whose minds are principally fixed on quantities of corn, pork and potatoes, may think differently.

A decision has been made in London, that Life Insurance Companies are not bound to pay on the life of a suicide.

Railroads vs. Canals.

The following statements are from the pen of Mr. A. Whitney, the bold projector of the Oregon railroad, being extracts from a letter addressed to G. W. Edwards, Esq. of Pennsylvania, and shows in bold relief the superiority of railroads over canals in general, and it might be added, under all circumstances.

THE STATE OF NEW YORK.—The canals of this State may be said to have been eminently successful, much more so than in any of the other States. The reason of this is obvious, for it may be safely asserted, that nowhere on this continent has nature presented so few and inconsiderable obstacles to the construction of an extensive system of canals or over which so large a trade could be made to pass.

By these canals, there is open on the north a navigable communication between the Hudson and Lakes Champlain and Ontario, and the lower St. Lawrence, by which an inland navigation is opened throughout the whole extent of that river, which, added to these lakes, gives a navigable line of waters extending not less than 2,000 miles.

On the west, a navigable connection is formed with lake Erie, at Buffalo and Black Rock. The lake coast thus opened, including lakes Huron and Michigan, extends 4,000 miles.—Besides these, there are several smaller lakes in the interior of the State, with which these canals are connected, thus forming, between all these points and the city of New-York, a navigable inland water communication of nearly 7000 miles in extent. To accomplish all this the State has constructed only 780 miles of canal, which have cost, $27,865,664

Besides this sum there has been expended on unfinished canals, 2,595,659

And there will be required to finish the latter, and to complete the enlargement of the Erie canal, the further sum of 15,000,000

Making the whole cost, when finished, $45,461,323

As has been stated, these 780 miles of canal cost $27,865,664. The net revenue derived from them, in the year 1844, was 1,803,768,—which is 6 1-2 per cent. on the amount paid for their construction, or a little less than six per cent. on the amount expended on all the canals.

There have been constructed and put in operation, in the State of New York, 548 miles of railroad, which have cost $11,213,789. The net income of all the roads for 1844, was 788,643, which is a fraction over 7 per cent. on their cost.

It is proper to remark here, that the canals of the State of New York being state works, the Legislature has refused to permit one of the main links of the line of road between Albany and Buffalo to transport property, except during the suspension of navigation on the canals, and then only by paying to the State the same tolls as would have been charged on such property, had it been transported on the State canals. This restriction affects the whole line of road between Albany and Buffalo, although, technically, it only applies to that portion lying between Schenectady and Utica—that portion of the line, therefore, lying west of Utica, cannot engage in a general transportation business to any considerable extent, because the same facility cannot be enjoyed east of Utica. If this restriction was removed, and the most approved means employed for performing that kind of service, there is no doubt the net revenue would be increased several per cent. on the cost of the whole line of road between Albany and Buffalo.

NEW ENGLAND STATES.—In these States, canals and railroads have been constructed and managed by corporations. Of Canals, there have been completed and put in operation 225 miles, 191 of which have cost $2,070,000. The cost of the remaining 35 miles I have no means of stating. The business of these 191 miles, in 1844, did not produce a net revenue of 1 per cent. on their cost; and the remaining 35 miles, it is believed, have not been more productive.

There have been constructed in New England, 854 miles of unfinished railroad, which have cost $31,029,636. The net revnue derived from these roads, in 1844, was 7 per ct. on the sum expended in their construction.—These comparisons might be continued with all the railroads and canals in the country, and it is believed the contrast would continue to be as much in favor of railroads, in a fiscal point of view, as it has been in the instances already cited; it is, therefore, deemed unnecessary to pursue the inquiry in this form, any further.

The Bible and Liberty.

The Bible is the great protector and guardidian of the liberties of men. There never has been on earth true liberty, apart from the precepts and principles of the Bible. This remark is fully sustained by the history of the world. Go to the plains of Babylon, and the entire history of that empire, until its destruction by Cyrus, is a history of the most absolute despotism. Egypt and Persia were equally strangers to civil liberty. The same was true, with some slight modifications of Greece and Rome. Facts spread on every page of the world's history, point to the Bible as the only basis of the temple of freedom.—Where the Bible forms public opinion, a nation must be free. "Christianity," says Montesquieu, " is a stranger to despotic power." De Tocqueville says: "It is the companion of liberty in all its battles and in all its conflicts—the cradle of its infancy, the divine source of its claims." The Abbe de la Mennais, whom a late writer distinguished as one of the most powerful minds in Europe, speaks eloquently of the Divine Author of Christianity, " as the great republican of his age." Everywhere, the men whose minds have been imbued with the light and spirit of the Bible, have been the devoted friends of civil liberty. Such were the Lollards in England, the adherents of Luther in Germany, and of Knox in Scotland. Such were the Huguenots of France, who fled their country, or sealed their testimony with their blood on the fatal revocation of the edict of Nantz. Such were the Puritans, who, with the courage of heroes and the zeal of martyrs, struggled for and obtained the charter of liberty which England now enjoys. Hume, with all his hostility to the Bible, says: "The precious spark of liberty has been kindled and was preserved by the Puritans alone, and it was to this sect the English owe the whole freedom of their constitution,—[North America.

The Wilderness of New York.

There is a large section of country consisting of about 8000 sqr. miles situated centrally between the Mohawk River and the Canada line, which continues in a wilderness state. Most of this land is elevated more than 1,400 ft. above tide water, and some of the highest elevations are said to be much higher than the White Mountains of New Hampshire, and near the regions of perpetual snow. In this uninhabited territory are upwards of 100 lakes of various sizes, from one mile to twenty miles in circumference.

An Appaling Fact.

There were two hundred and seventy-five cases on the docket of the Court of Common Pleas at Worcester, at the recent term, *of which two hundred and thirty-one were for offences begun in liquor.*

California Rye.

One-eighth of an acre of California rye, sown in Taliefero, county, Ga., has produced thirty six bushels,—at the rate of 288 bushels per acre! So the papers say.

A young man from Millersburg, was recently fined $1,000 for insulting a young lady in a fruit store in Cincinnati.

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Manufacture of Iron.

A series of Practical Experiments highly interesting to Iron Manufacturers.

BY M. AUG. MALBERG.

[From the Bulletin du Musee del l' Industrie.]

The accidents originating in the breaking of locomotive engine and railway carriage axles have given rise to enquiries and experiments, as to the quality of the iron of which such axles had been made.

The surface of the fractures which were examined presented large crystals, and as the axles had mostly been in use a considerable time, the conclusion arrived at was, that the crystaline texture resulted from the action to which the axles had been submitted whilst in use. The commission appointed by the French Government to institute enquiries on the occasion of the accident on the Versailles railroad, declared, that if the axles had been manufactured from iron possessing a strong tenacious fibre, the daily rotation and contact with the rails would give rise to electric or galvanic action of such a nature as to produce changes in the body of the iron, so injurious, as regards its tenacity and ductility, as to render it quite unfit for use.

Mr. Charles Hood subsequently published an article, in which he maintained that the principal causes which produce a crystaline texture in wrought iron, originally of a tenacious and fibrous nature, are shocks, elevation of temperature, and magnetism; and he adds that it is doubtful whether one of the forces alone would be sufficient to produce that effect, but there is every reason to believe that by the combination of all three these phenomena are produced.

The original texture of bar-iron is granular and angular. It is by being submitted to the action of the hammer or rollers that it acquires a fibrous texture, as by those means the crystals are drawn out and elongated. This is more especially the case when the rolling process is employed; for when the hammer is used, it is not unusual, especially in large pieces of iron, to find the interior granular, whilst, at and near the surface it has been more or less fibrous. The difference or inequality in the texture arises from the fact that the blows of the hammer, whatever may be its weight, do not penetrate to the interior of the iron. The property possessed by the iron, of passing from a granular to a more or less fibrous state, depends upon the primitive quality of the iron; some pigs possess it to a less extent than others. Consequently, in order to judge of the texture of iron from a recent fracture, it is indispensably necessary to pay attention to the manner in which the fracture has been occasioned.

A fracture caused by loading a piece of iron in a longitudinal direction, or in the direction in which it has been rolled or hammered, will generally, in iron of good quality, be angular; the fibres are drawn out in fine points, and more so in rolled than hammered iron; it also presents a different aspect under incidential and reflected rays of light, being either of an ash grey or dead silver color, or a mixture of both. In order to judge of the quality of iron from this, the bar must be turned in every direction, and the light thrown upon all sides of the fracture and in the middle. When, under these circumstances, the fracture appears of a greyish color, with short fibres and very slightly angular, the conclusion may be safely arrived at, that it is iron of an inferior quality. It is, however, advisable to take into consideration whether the fracture was occasioned by a sudden shock, or by gradual augmentation of the charge. In the former case, the iron appears of a light grey color, more crystaline, with short fibres, and its fibres do not terminate in fine points; whilst, in the latter case, it is thready, and of dead silver color under certain incidence of light.

When, on the contrary, the iron is broken in a direction at right angles with that in which it was rolled (but in such manner as to take its absolute tenacity into consideration,) the fracture is always very short and the absolute resistance less. According to experiments by *Navier*, this resistance is 10 per cent. less in boiler-iron. The fracture in which the distinct strata or layers serving to form the bar, by welding, are perceptible, presents a flaky appearance; it is white when viewed by reflected light, and grey under incidental light; very often traces of a fine steely grain are perceptible. It is in consequence of this being observed, that iron which is required to offer resistance in every direction, as, for instance, boiler-iron, is rolled, not only in the direction of its length and breath, but also diagonally. The relative resistance is, in fact, less in a direction at right angles to that in which it was rolled; and pieces which require eight, ten, and even twelve blows with a hammer in order to break them in the direction of rolling, often break in the other direction at the third, fourth, or fifth blow. This phenomenon is of the greatest importance in the construction of cranks of railway axles, which are wrought in one piece.

A fracture in a traverse direction (relative resistance) is always whiter when effected by striking the bar upon the edge of an anvil, than when produced by the pressure of a weight in a longitudional direction, (absolute resistance) and the cause of this is the different manner in which the reflecting faces are presented to the light; in general it is not so veiny as the fracture in the longitudional direction. If the different layers or strata of which the bar is composed are not well welded together, they will separate, and from faces of greater or less extent and smoothness. If these layers have not been well purified before welding, black spots will appear, consisting of carbon, or other impurities, which prevent their becoming perfectly united. In order to prove that the bar is perfectly welded, it is drawn out into a thin sheet, at a heat below welding heat, and if no flaw is then perceptible, the welding has been perfectly effected.

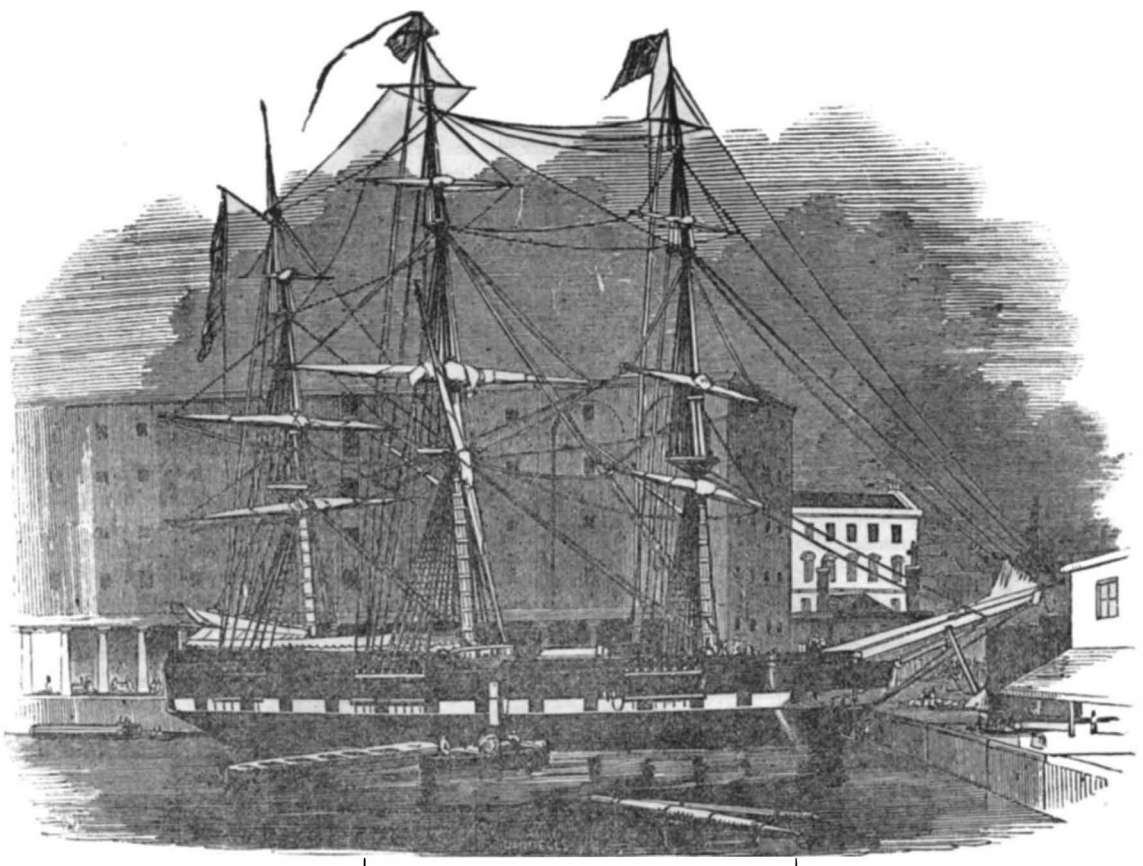
When striking the iron in order to break it, the fracture may be more or less modified, according to the weight of the hammer employed, the force of the blow, or the length of the piece detached. A long piece of iron, hammered with small hammers in one direction only, always presents a very veiny fracture, whilst when operated upon with heavy hammers, it presents a short, fibrous, or crystaline grainy texture. The fracture is always somewhat crystaline on its under surface, where the bar rested upon the anvil. When the fibres of the upper surface are broken or torn apart, those of the under are, in consequence, compressed or forced together, and shortened;—these latter fibres are, therefore, seldom of a veiny character, but are generally of a fine steel-like grain. This is seen more especially when the iron is broken by being bent backwards and forwards several times. I have often experienced this, and my observations on this head are in accordance with the experiments recently made on the Rhine railway, in which railway axles were broken, on the one hand, by means of a monkey weighing 1112 lbs. falling from a height of from 16 to 36 feet and on the other by means of a hammer of very light weight.

I will state two of the experiments made upon the Rhine Railway, which appear to me to confirm the facts above stated:—A wrought or hammered iron axle, belonging to a railway wagon for transporting earth, was broken by the weight of 1112 lbs., falling a height of ten feet. The faces of the fracture were of a coarse crystaline character. The same axle, broken by several blows with the small hammer, presented all round the outside of the fracture a fine greyish grain, similar to cast-iron, and in the middle a grey crystaline texture. A rolled iron axle, which, on being broken by the weight, was crystaline, was, when broken by the smaller hammer, perfectly ductile and veiny.

On comparing the faces of the fracture of iron wrought by the hammer with that of rolled iron, the latter always appear more tenacious and veiny than the former. Forged iron is always of a less uniform character than rolled iron; it presents on the faces of the same fracture all degrees of texture, from the fine steel-like grain to the coarse crystaline grain, the whole combined with a veiny texture. In the former also more frequently than the latter, and especially in large pieces, flaws are met with, in consequence of imperfect welding.—These facts arise from the rolling being performed in less time, and with more care and attention than work performed by the hammer. In this latter mode, too elevated a temperature may deteriorate the quality of the iron, and too low a temperature renders it brittle: a defect which may, doubtless, be afterwards remedied, but to which sufficient attention is not paid in forging.

(*To be continued.*)

THE PACKET SHIP MARGARET EVANS.



The New York Proprietary to the London Packet Line have of late been enlarging their establishment, to keep pace with the increase of sea-going passenger population between the two metropolitan supremacies of Europe and America. Thus, one packet will hereafter run weekly from each side of the Atlantic, instead of once in ten days; and, punctually to perform the promise, four new vessels have been built to be placed on the line. One of these, the MARGARET EVANS, is now on her second voyage; and a noble liner she is:—In measurement, 1000 tons; length on deck, 266 feet; breadth of beam, 36. The under-deck steerage accommodation affords "ample space and verge enough;" not alone for alongside ranges of berths, but for promenades, *conversazioni*, and *soirees dansantes*, should the some hundreds of passengers who have secured most of the places be so disposed. There is, besides, a most convenient novelty prepared for them in a forecastle deck, to shelter them from the casual out-door inclemencies of weather which may befal in the voyage. But the grand and ladies' cabins are the triumph of ship-building art. There is nothing to compare with them except in the VICTORIA, one of the same class of liners. Here there is no veneering, but solid splendid wood and workmanship, all through of the finest and most expensive handicraft. Couches and carpeting there are of Eastern luxury. A sight alone should tempt the fashionable votaries of Hymen to spend their honeymoon in a trip across the Atlantic, rather than in a country excursion, where trees and green fields of every day's wear are alone to be seen. And, by the way, Capt. Tinker, the commander of this noble vessel, and a very favorable sample of the land beyond the sea, is, as reported, to change his state on his return; whether the MARGARET EVANS represents the name of the bride, however, does not appear. But, like a proper bridegroom, he has put his house, that is his ship, in sumptuous order to receive his betrothed on return from his voyage in her.—Ventilation, without storms, and chilly draughts, is insured by air-pipes, carried below, which let in all the supply of air necessary for the comfort of passengers, or the condition of cargo, down to the bottom of the hold. She has accommodation for 60 persons in first and second class cabins, and 300 in the steerage.

The Power of Kindness.

At the London Sunday School Anniversary, one of the speakers said :—

The governor of the Reformatory in the Isle of Wight, told me that there came into that prison a boy that had been convicted fifteen times, and as often committed to jail. The governor remarked: "When he came to my room, I said, 'My boy, I am your friend from this moment. I will take you to the chaplain, and he will be your friend;' and together they prayed for that boy's conversion. He never displayed, during the two years he was in confinement, the slightest opposition to the will of the governor, who had thus acted kindly towards him. See what kindness can do! The time of his imprisonment was over, and the governor told him that he had no longer power to keep him—that the doors were open. The boy stood at the door from morning till night, and said, "Let me entreat you to keep me in prison." So great had been the power of Christian kindness over him.

Shovel and Hoe Factory.

A large shovel and hoe manufactory is now in successful operation at Augusta, Me., in which all the variety of shovels and hoes, of the best quality, are manufactured with facility. Several other projected manufactories and works of enterprise, have been abandoned on account of the new tariff laws.

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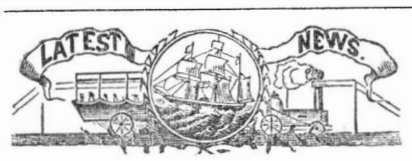


The Storm of the11th inst.

It appears by recent reports from various parts of the Atlantic, that the destruction of vessels by that storm was beyond all precedent. At Havana, fifty vessels are reported to have been lost in the harbour, and of six hundred houses on Key West, only six have escaped its effects. The water ran through the town five feet deep. "Never in the annals of American commerce," says the N. Y. Sun, "has there been a season so disastrous to shipping, as the present autumn. In fact, from the reports it would appear as if the whole ocean was strewed with wrecks and fragments of wrecks." We think it fortunate for the Great Britain's company and crew, that she got aground where she did: otherwise all would probably have found a deeper bottom.

Late Fires.

On the 16th ult., a large part of the city of Apalachicola, Florida, was laid in ruins by incendiaries. The town was fired in four or five places at about the same time. One of the villains was shot at, and narrowly escaped with his life. The number of houses destroyed was nearly fifty.

In Beverly, Mass., on the 21st, an India Rubber Factory was destroyed, with the stock and machinery, valued at about $4,000.

A large brick store at Waitesfield, Vt., was destroyed on the night of the 15th. This fire was occasioned by an attempt to draw alcohol from a cask by lamp light.

In Leyden, Mass., a dwelling house was consumed on the 22d, and two children, 4 and 2 years old, perished in the flames.

At Belfast, Me., on the 24th ult., four buildings, one of them very large, were destroyed.

In Hudson, N. Y., on the 24th, a large carriage establishment and several other buildings were consumed.

In Suffield, Ct., a dwelling house was destroyed, and a boy 15 years old perished therein. This fire is supposed to have been caused by an insendiary.

At Utica, on Monday last, a soap and candle factory and store house, with all its contents, were destroyed.

Correction.

The article on the subject of the distance of the Sun, in our last number, should have been credited to the Providence Gazette.

P. S.—Since writing the above correction, we have received a communication purporting to refute the theory of Mr. Cottrell, and says: "We know from actual measurement with the best of Theodolites, Repeating circles and other mathematical instruments, that the angle at this Earth, subtending the diameter of the sun is 32'.2": and taking his distance of 36,000 miles to be correct, we would find the diameter of the sun to be 335 1-5 miles. And, as we know that the moon is a shorter distance from us than the sun is, we will find (if his distance be correct) the moon to be *five or six days* passing through the next Eclipse." It was evident at sight that the theory of Mr. C. was incorrect, but we were in hopes to draw something more explicit on the subject, than our anonymous correspondent has furnished.

Naval Movement.

Great preparations are said to be making, for an attack on Vera Cruz, at which point nearly all our largest ships are to be concentrated. It appears to us like a very awkward business at best. Had government adopted the simple "battering engine," which has been constantly offered for six months past, all the fortifications on the Mexican coast might have been destroyed ere this, without the loss of a man, and with one half of the expense which has been already incurred in doing nothing.

Said Bill to Jack, "How many legs would a calf have, calling the tail one?"

"Five," answered Jack.

"No it wouldn't, for calling the tail one would not make it so."

The Patent Laws.

During a discussion by the recent Convention of Inventors, at Philadelphia, of the Patent Law proposed by Mr. Keller, late of the Patent Office, it was objected that under that law, the granting of patents is placed exclusively in the power and at thr discretion of the Commissioner, without proper appeal: and when it was proposed by the advocates of inventors that an appeal should lie to the Circuit Judge of the District, Mr. Keller objected on the ground that in case of such right of appeal, most of the decisions of the Commissioner would probably be reversed, and that consequently the Patent Office would be brought into contempt. It strikes us that this argument while it furnishes a negative compliment to the Commissioner, is strictly and strongly in favor of the right of appeal.

The Telegraph and Election.

At midnight between Tuesday and Wednesday last, all the returns of the election of the day previous, that had been received at Buffalo up to that hour, were communicated to this city, and appeared in the papers of the same morning.

We give the following as a specimen of itemical news, as communicated by telegraph:

Philadelphia, 3d Nov., 11 P. M.

The night train from New York has not yet arrived. Reports of Whig gains in New Jersey have come in. No local news. It is raining.

A Disappointment.

An Irishman once dreampt that he visited the Lord Mayor of London, who treated him with the greatest hospitality, and asked him he wouldn't "*take* a little su'thin'." He replied that he wouldn't mind a little whiskey punch. "Hot, or cold? inquired his lordship.—His guest preferred it warm, but while the Lord Mayor was out heating the water, the Irishman awoke from his delicious slumber. "Och!" cried he, comprehending what a fool he was to wait for hot punch during the precarious tenure of a dream, "how I wish I'd said *cowld!*"

English Railway Capital.

The Railway Record says, the total amount of capital authorised to be raised by the railway acts of last session is—for England, about £70,000,000; for Scotland, £13,500,000; and for Ireland, £9,000,000. The deposits prepaid in respect of these undertakings, amount in round numbers to £5,000,000.

A calculation of the cost of French railways gives the following results: The total expense, 2,169,114,782f.; total dependent on the companies, 1,659,674,782f.; on the state, 449,440,000f. Out of the above obligations on the companies, there has been already deposited the sum of 437,750,000f. The state has devoted the sum of 182,500,000f.—[R. R. Jour.

The Avalanch.

Many of our readers will remember hearing of the avalanch from the White Mountains, by which a mother and children were buried. Within a few weeks, by the removal of some earth near the Wiley House, one of the children has been exhumed.

Woonsocket Railroad.

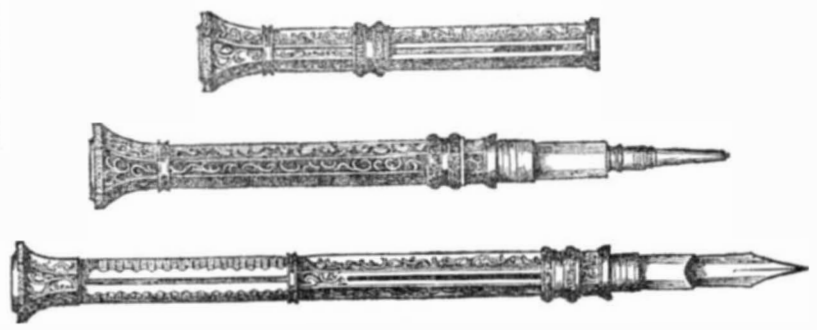
The recent meeting at Newton, of the advocates of the proposed straight railroad between New York and Boston, consisted of above five hundred delegates. They resolved to petition for a charter from Massachusetts.

An Insinivation.

The Sun advances the opinion that the (niggardly) Wall street man, who gave not "one cent reward" to the poor honest boy who found and restored to him $500 which he had lost, ought to have given the boy at least a *Lewis* d'or. Is the man's name Lewis?

We would recommend the Hat wearing community to call on GURNEY, 134 Fulton street, where they can be furnished from a good assortment, as cheap as the cheapest, and as good as the best.

Mr. Hall Colby has left at this office, two very fine descriptive maps of the Solar System, which the public are invited to call and examine.



Bagley's Patent Extension Penholder and Pencil.

THIS is the most compact, complete, convenient and useful pocket companion ever offered to the public. The multiplicity of its usefulness and the smallness of its size, renders it a perfect MULTUM IN PARVO.

In the short space of 2 3-4 inches is contained a Pen, Pencil, and a reserve of leads, and by one motion slides either the pen or the pencil out and extends the holder to six inches, which is but little more than half the length, when shut up, of the common pen holder, but when extended is one fourth longer. This article is secured by two patents, and the Manufacturers are now ready to receive orders for them in any quantity, either of Gold or Silver, together with his celebrated ever pointed Gold Pens, which need no proof of their superiority except the increased demand for the last six years, and the numerous attempts at imitation.

A. G. BAGLEY, No. 189 Broadway.
New York, Sept. 1, 1846. o24 tf

Earthquakes in Trinidad.

The Journal of Commerce, of October 27, states that 12 or 15 shocks of earthquakes have been felt in the island of Trinidad, in the course of a few days. Much damage has been done to buildings, and the ground has been cracked in several places. Some of these shocks were more severe than any which have been felt there for many years. Two of the shocks occurred during divine service, and one of them while several persons were attending the theatre. The inhabitants are alarmed at the frequency and severity of the shocks, and fear a repetition of them. In one of the churches, a stone fell from the tower during service, but did not injure any person. This information, we understand, comes from a young lady now in Trinidad, in a letter to her family, resident in New Haven, Conn., and by them has been communicated to one of the editors of the Journal of Commerce, whose residence is in that city. We shall ere long, probably, be able to ascertain on what days of the month these shocks took place. The island of Trinidad is in latitude between 11 and 12 degrees north, and longitude 61 and 62 west, is about 50 miles long, and about thirty-three wide. There are mountains here three thousand feet high. The famous lake of bitumen is in this island, and it contains also several mud volcanoes. Trinidad is but twelve miles from the main land, and opposite Colombia, South America, being but about a dozen miles distant therefrom. The lakes of bitumen in Trinidad, would, in a high northern latitude, become cannel coal by crystalization by cold.

ADVERTISEMENTS.

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☞ This ingenious invention consists of a neat box in which are arranged in a scientific manner, all the most brilliant colors, THIRTY FIVE IN NUMBER, represented by as many convex discs of the FINEST SILK. Each disc bears a number referring to an explanatory scale. The attention of storekeepers, milliners, and indeed all who have occasion to vend or purchase colored articles of any kind, is respectfully invited to this new and valuable discovery. More trouble can be saved by its use in ONE DAY than four times the amount of its cost. For sale, wholesale and retail, at the office of the Scientific American, 128 Fulton st., 3 doors from the Sun Office.

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Manufacture of Water Colors and Black Lead Pencils.

Any improvement or advancement in the fine arts, at all times, has claims to attention; but where such applies more particularly to the delicacy, yet firmness, of the pencil, and the transparency or opaqueness of colors used in depicting machinery, such has a twofold claim on our attention. It is well known that, in the manufacture of water colors, gum has formed a component part, not only attaching brilliancy to the tone of color, but giving necessary firmness, or compactness to the cake. It, however, has been found, after much study, and attention to the admixture of colors, and their manufacture, that the gum might be superseded by the employment of wax—at the same time rendering the colors readily soluble with water, while the tone given nearly approaches an oil painting. One of the main features in this improvement may be said to consist in the power acquired of washing over the color once laid down without the danger to be apprehended from moving or destroying the transparency or brilliancy—a point which those acquainted with the mechanical drawings can well estimate. The testimonials submitted to us, of the importance to be attached to the introduction of wax instead of gum, and now before us, embrace the principal historical and landscape painters of the day, whether in oil or water colors. Messrs. Reeves & Sons have also lately introduced a superior black-lead pencil, manufactured from the dust of pure Cumberland lead—a step taken by them in consequence of the lead mine in Cumberland, from which the supply has heretofore been acquired, having failed to produce the quality, if not the quantity of lead, which has been extracted from it in past days. The importance to be attached to the freedom of handling by the pencil, which depends mainly on the purity of the lead, while they are free from grit, and possess the several varieties of hardness and tint that may be required, forms one of the most prominent claims on attention. Having availed ourselves of the use of both of the pencils and colors, we have no hesitation in adding our humble testimoy to that rendered by the principal artists of the day.—Min. Jour.

To make an unproductive Tree Bear.

A lady of our acquaintance, took us into her garden, recently, where we were shown an apple tree which she informed us had been planted for ten or more years, but had never until last year borne any fruit. In looking over an old volume, she accidentally met with what puported to be a remedy for this unproductiveness, which was simply to cut from each limb, close to where it diverges from the trunk, a piece of bark about half an inch round the limb, one inch in width, immediately replace it by tying it on with a rag until it adheres again. Early last spring, she tried this experiment upon the tree we speak of, leaving however, two or three limbs untouched. The result was, in the autumn it was filled with apples; but it is worthy of remark, that those limbs only which had been cut bore fruit.—The operation is very simple, and as it has proved successful in this instance, we have no hesitation in recommending its trial in similar cases.—[Reading Gazette.

The Otaheite Phenomenon.

Kotzebue, who visited the island of Otaheite only a few years ago, was the first to communicate to the world the singular law by which the tides of this island are regulated—namely, that the time of high water *is precisely at noon and at midnight all the year round.* The island of Otaheite was discovered by Captain Wallis, in 1767. In 1790, it was visited by the celebrated Capt. Cook, accompanied by Dr. Solauda and Joseph Banks. An accurate survey of the whole island was made by them. It has since been visited by hundreds of navigators from all quarters of the old and new world, yet none of them (expect Kotzebue) have condescended to notice this wonderful phenomenon, though it is of a nature to attract he attention of the most carless observer.

Prof. Clowes's Arithmetical Process.

We have been truly astonished at the facility with which Prof. Clowes performs the most difficult arithmetical process, and arrives at the most accurate results. In introducing the subject, and speaking of the difficulty of engaging the attention of the New York public to this immensely important improvement, and of giving instruction therein by a course of illustrative lectures, he appropriately remarked that if he should show the people of this City that he could whirl round sixty times in a second, or play a tune on one string of a fiddle, or even teach some fancy science in a foreign language, there might be less difficulty in exciting attention or obtaining an audience, than when a time and labor saving mode of accomplishing a common business operation is offered. As an illustration of the extraordinary facility of the improved process we give below a few examples of arithmetical answers, which were given in our office, in less time than an ordinary clerk would copy the numericals employed therein. First was required the square root of each numeral from 2 to 8 inclusive, which were given in about one minute to each question by Prof. Clowes, as follows:

The square root of
2 is 1.4142135623731.
3 — 1.732050807.
4 — 2.
5 — 2.236067977.
6 — 2.49489742.
7 — 2.645751311.
8 — 2.828427124746.

He next gave the cube roots of 2 to 9 inclusive, in less than one minute each, as follows:

The cube root of
2 is 1.25992102.
3 — 1.44224957.
4 — 1.58740105.
5 — 1.709975946.
6 — 1.81712059.
8 — 2.
9 — 2.0800838.

He next gave an example in subtraction, in which, by a single and simple process, he subtracted three several sums from three others, which he accomplished in one minute, thus:

From
543228.
276981.
854368.

The sums of
764229.
349728.
964371.

403751.

In multiplication,
214650396864290075718253570 31
Was multiplied by
344827586206896551724137031.

As rapidly as the figures could be made, say about two minutes, giving the following product:
7,401,737,822,906,554,335,112,192,389,259,826 217,709,344,566,488,780,761.

We shall give illustrations and explanations as far as practicable of this improved process in future numbers, for the benefit of our readers, although we are aware that it will require much labor to elucidate the subject so as to be understood in all its branches. The improved process has never yet been published, but we have arranged to lay before our readers such light on the subject as will be highly useful to all who have frequent occasion for numerical operations.

Improved Factory System.

A factory has been established at Bradford, England, to be conducted on an improved system. The operatives are required to work only ten hours, and with the factory are connected an excellent school and other means of instruction, with improved wholesome accommodations for boarding, lodging, &c. It is reasonably supposed that the compensation paid is somewhat less than in other factories; but the proprietors will enjoy the conscious satisfaction of having treated their operatives as fellow beings, and will be supplied with the most respectable and faithful class. In this country, especially at Lowell, with the single exception of excessive working hours, very little improvement is required for the benefit of the operatives employed. We should be glad to see the experiment made, however, of establishing improved regulations at some one of the mills, with better style of boarding and less working hours, though with less wages paid, just to see whether such regulations would become readily popular, and supplied with the requisite number of operatives.

(Communicated.)

Mr Editor, I think the following is curious, and may be added to the long list of "remarkable properties" of the same nine digits, the youngest in particular.

Digits,	1	2	3	4	5
Names,	one,	two,	three,	four,	five,
No. of letters,	3	3	5	4	4
Digits,	6	7	8	9	
Names,	six,	seven,	eight,	nine.	
No. of letters,	3	5	5	4	

You will observe in the above, that the sum of the number of letters in the names of the digits is 36, which is divisible by 9, the sum of the component figures, 3 and 6 is 9; observe also, that the figures in the lowest line are in a certain fixed order, viz: we find that they are composed of three 3's, three 4's and three 5's, in the following order: we first have two 3's, and after jumping three figures, we have the third 3; next we have two 4's, and by skipping three figures, as before, we find the third 4, and so of the disposition of the 5's

If the above is of any use to you, take it; if not, I shall immediately get it patented or copyrighted, and make my fortune.

J. C. R.

A Sturgeon Propellor.

It is stated in one of our exchanges, that a person who lived east of the Hudson, a little back of Trivola, caught a sturgeon which weighed one hundred and sixty pounds. He carried it to a large pond near his house, the longest diameter of which is near a mile, and without taking it out of the net in which he had caught it he knotted some of the meshes closely around it, and attaching them to a pair of lines put the creature into the water. To the end of the line he had taken care to attach a buoy, to mark the place of the fish in the pond. He keeps a small boat, and when he has a mind to make a water excursion, he rows to the place where the buoy is floating, ties the lines to the boat, and pulling them so as to disturb the fish, is drawn backward and forward, with great rapidity, over the surface.

We have not learned whether this aquatic Jethro has yet broken his pony to the bit but living so near the Yankee towns as he does, we should suppose he would find no difficulty in finding some method of guiding and directing his team according to fancy.

Boring Glass.

We have heretofore spoken of the method of boring or drilling glass by means of placing a drop of turpentine or camphor thereon, and using a common drill. We published something of the kind in the New York Mechanic, five years ago. We now learn that the dicovery is claimed by several persons, among whom is Lieut. W. D. Porter, of the U. S. Navy.—From these circumstances we are inclined to think that there is some utility in the discovery.

Itinerant Science.

A Connecticut artist, has fitted up a large double wagon into a sort of saloon, with a Daguerreotype apparatus, and is going about from place to place, like a tin peddler, calling at houses and taking pictures here and there, as he can find customers.

Petrified Wood.

In the vicinity of Independence, Texas, pieces of wood, petrified, are found in great quantities. In some localities, stumps of trees of the same size, and from two or three and twenty feet long, cover the whole face of ground. Magnificent specimens might be obtained there for cabinets.

Mr Wise, the Ærenaut, proposes, in the Lancaster, Pa., paper, to capture the Castle of St. Julian d'Ulloa, at Vera Cruz. He proposes to assend from on board a vessel in a balloon, the car of which shall be filled with percussioned bomb shells and torpedoes, to the amount of 18,000 lbs. The balloon, with a cable attached, can make an elevation of a mile in height, out of the reach of shot, and being poised over the Castle, can with great accuracy and precision, hurl down the dreadful missels upon them, scattering destruction among the enemy in all directions. More easily said than done.

The Boston Water Works.

The Water Commissioners have concluded contracts for the grading of the residue of the acqueduct from Long Pond to the site of the proposed reservoir in Brookline. These contracts embrace the excavation of two tunnels, one in Newton, 2300 feet in length. In the course of a few weeks, the grading of the whole line, a distance of fifteen miles, will be in active progress, and the work will be prosecuted without interruption through the winter.

Mechanical Enterprise.

Six brick houses near the Girard College, Philadelphia, are to be removed to the opposite side of the road, which task has been undertaken by a New York company. This removal of brick buildings is wholly an American invention.

Chance for an Engraver.

The Southern Planter, published at Richmond, Va., says, "the only individual now in the city of Richmond who can cut a wood engraving is a portrait painter This gentleman is kind enough to do a little work for us sometimes; but of course we have to wait his exemption from his professional duties."

One day on the Railroad.

The Hamburgh, S. C., journal notices the arrival of one thousand two hundred and twenty-three bales of cotton in one day at that place.

The Pittsburgh Chronicle states that fifteen new Roman Catholic churches are now in progress or erection in the diocese of Pittsburg, all of which will be completed within the year.

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